Citation:

Kurzthaler I, Wambacher M, Golser K, Sperner G, Sperner-Unterweger B, Haidekker A, Pavlic M, Kemmler G, Fleischhacker WW. Alcohol and benzodiazepines in falls: an epidemiological view. *Drug Alcohol Depend.* 2005 Aug 1;79(2):225-30.

PubMed ID: 16002031

Study Design:

Case-Control Study

Class:

C - Click here for explanation of classification scheme.

Research Design and Implementation Rating:

NEUTRAL: See Research Design and Implementation Criteria Checklist below.

Research Purpose:

To obtain an epidemiologic measure of the relationship between fall-related accidents and alcohol consumption and/or benzodiazepine use in patients across all ages.

Inclusion Criteria:

- Patients admitted to the emergency room injured by falls over a 12 month period
- Subsequent admissions as an in-patient

Exclusion Criteria:

- Cases that did not end up in a hospital admission
- Children and teenagers < 18 years of age

Description of Study Protocol:

Recruitment: Eligible patients were recruited to provide a blood sample.

Design: Case-control study

Blinding used (if applicable):

- Anonymity of the patients was ensured by using an individual code-number for each subject
- Physician responsible for the study had no information about the patient's name, initials or exact date of birth
- Laboratory value used to establish alcohol intake level

Intervention (if applicable): not applicable

Statistical Analysis

- Chi-square, Fisher's exact test, or Mann-Whitney *U*-test: comparisons of victims of falls (fall-group) with other accident victims on participant characteristics
- Relationship between alcohol and benzodiazepine consumption (yes/no): univariate setup using chi-square and by a multivariate approach using logistic regression.
    - association between severity of injury and potential predictors (age, sex, alcohol consumption and benzodiazepine consumption also analyzed
- Relationship between blood alcohol concentration (BAC) within the fall-group: analysis of covariance
- Further comparisons to examine differences between fall-group and other accident victims (control group):
    - subsample of control group matched by sex and age±4 years for those up to 70 years of age
    - comparisons between the two groups with respect to alcohol and benzodiazepine consumption : Fisher's exact test or Mann-Whitney *U*-test

Data Collection Summary:

Timing of Measurements: one measurement time upon admission as inpatient to hospital

Dependent Variables

- Fall-related injury: single trauma or polytrauma

Independent Variables

- Blood alcohol concentration (BAC): blood sample collected within 1.87±1.20 hours from time of injury

Control Variables

- Age
- Sex

Description of Actual Data Sample:

Initial N: N=1611 patients injured in an accident

Attrition (final N):

- N=615: fall-group (44.1% male; 55.9% female)
- N=996: accidents of other causes (control group) (74.1% male; 25.9% female)

Age:

- Fall-group: 64.8±20.8 years; 48.6% > 70 years
- Control group: 40.5±16.2 years; 4.8% > 70 years
- P<0.001

Ethnicity: not specified

Other relevant demographics:none specified

Anthropometrics:

Location: Austria

Summary of Results:

Key Findings

- 22% of 615 patients tested were positive for alcohol, 55% were positive for benzodiazepines and 1.5% were positive for both substances
- A significantly larger proportion of males tested positive for alcohol than females (40.2% versus 7.6%).
- Benzodiazepines were also consumed more frequently in males than in females (8.5% vs 3.2%, P = 0.007).
- The percentage of both male and female patients who had consumed alcohol at the time of the accident decreased significantly with age (≤ 50 years: males=52.6%, females=20.4%, P<0.002; 51-70 years; males=45.3%, females=17.8%, P<0.001; >70 years: males=18.3%, females=0.9%, P<0.001; all age groups: males= 40.2%, females= 7.6%, P<0.001).
- Within specific age groups up to age 70 years, the consumption of alcohol was substantially higher in patients hurt by a sudden fall than in age-matched sample of patients involved in accidents of other causes both in males (1.80 ±0.80 versus 1.40±0.76, P=0.017) and in females (1.74 ±0.90 versus 0.93±0.36, P=0.059).
- In persons up to 70 years of age, the consumption of alcohol in males and in females was substantially higher in patients hurt by a sudden fall (males=49.7%; females=18.9%) than in age-matched sample of patients involved in accidents of other causes (males=20.6%, females=3.1%), P<0.001.

Other Findings

- Within the fall-group, most patients sustained a single trauma; 9.4% suffered a polytrauma, and 1% were diagnosed as a polytrauma.
- The diagnosis of a polytrauma occurred more often in the control group (P<0.001)
- Alcohol consumption was significantly higher in males than in females in all age groups.
- There was no difference in blood alcohol concentration between males (1.75±0.81 g/l) and females (1.66±0.91 g/l) across all age groups.
- In patients older than 70 years of age, the blood alcohol concentration (1.73±0.83 g/l) was lower in comparison to the younger ones (P=0.06).

Author Conclusion:

This study shows that in fall-related accidents, alcohol plays a more important role in patients up to 70 years in comparison to accidents of other causes in frequency as well as in quantity of substance.

Reviewer Comments:

Significant differences between cases and controls in terms of age and gender, as well severity of injury.

Research Design and Implementation Criteria Checklist: Primary Research

Relevance Questions		
1.	Would implementing the studied intervention or procedure (if found successful) result in improved outcomes for the patients/clients/population group? (Not Applicable for some epidemiological studies)	N/A
2.	Did the authors study an outcome (dependent variable) or topic that the patients/clients/population group would care about?	Yes
3.	Is the focus of the intervention or procedure (independent variable) or topic of study a common issue of concern to nutrition or dietetics practice?	Yes
4.	Is the intervention or procedure feasible? (NA for some epidemiological studies)	N/A

Validity Questions		
1.	**Was the research question clearly stated?**	Yes
1.1.	Was (were) the specific intervention(s) or procedure(s) [independent variable(s)] identified?	Yes
1.2.	Was (were) the outcome(s) [dependent variable(s)] clearly indicated?	Yes
1.3.	Were the target population and setting specified?	Yes
2.	**Was the selection of study subjects/patients free from bias?**	No
2.1.	Were inclusion/exclusion criteria specified (e.g., risk, point in disease progression, diagnostic or prognosis criteria), and with sufficient detail and without omitting criteria critical to the study?	Yes
2.2.	Were criteria applied equally to all study groups?	Yes
2.3.	Were health, demographics, and other characteristics of subjects described?	No
2.4.	Were the subjects/patients a representative sample of the relevant population?	???
3.	**Were study groups comparable?**	???
3.1.	Was the method of assigning subjects/patients to groups described and unbiased? (Method of randomization identified if RCT)	Yes
3.2.	Were distribution of disease status, prognostic factors, and other factors (e.g., demographics) similar across study groups at baseline?	???
3.3.	Were concurrent controls used? (Concurrent preferred over historical controls.)	Yes

3.4.	If cohort study or cross-sectional study, were groups comparable on important confounding factors and/or were preexisting differences accounted for by using appropriate adjustments in statistical analysis?	N/A
3.5.	If case control or cross-sectional study, were potential confounding factors comparable for cases and controls? (If case series or trial with subjects serving as own control, this criterion is not applicable. Criterion may not be applicable in some cross-sectional studies.)	???
3.6.	If diagnostic test, was there an independent blind comparison with an appropriate reference standard (e.g., "gold standard")?	N/A
4.	**Was method of handling withdrawals described?**	Yes
4.1.	Were follow-up methods described and the same for all groups?	Yes
4.2.	Was the number, characteristics of withdrawals (i.e., dropouts, lost to follow up, attrition rate) and/or response rate (cross-sectional studies) described for each group? (Follow up goal for a strong study is 80%.)	No
4.3.	Were all enrolled subjects/patients (in the original sample) accounted for?	Yes
4.4.	Were reasons for withdrawals similar across groups?	N/A
4.5.	If diagnostic test, was decision to perform reference test not dependent on results of test under study?	N/A
5.	**Was blinding used to prevent introduction of bias?**	Yes
5.1.	In intervention study, were subjects, clinicians/practitioners, and investigators blinded to treatment group, as appropriate?	N/A
5.2.	Were data collectors blinded for outcomes assessment? (If outcome is measured using an objective test, such as a lab value, this criterion is assumed to be met.)	Yes
5.3.	In cohort study or cross-sectional study, were measurements of outcomes and risk factors blinded?	N/A
5.4.	In case control study, was case definition explicit and case ascertainment not influenced by exposure status?	Yes
5.5.	In diagnostic study, were test results blinded to patient history and other test results?	N/A
6.	**Were intervention/therapeutic regimens/exposure factor or procedure and any comparison(s) described in detail? Were interveningfactors described?**	Yes
6.1.	In RCT or other intervention trial, were protocols described for all regimens studied?	N/A
6.2.	In observational study, were interventions, study settings, and clinicians/provider described?	Yes

6.3.	Was the intensity and duration of the intervention or exposure factor sufficient to produce a meaningful effect?	N/A
6.4.	Was the amount of exposure and, if relevant, subject/patient compliance measured?	N/A
6.5.	Were co-interventions (e.g., ancillary treatments, other therapies) described?	N/A
6.6.	Were extra or unplanned treatments described?	N/A
6.7.	Was the information for 6.4, 6.5, and 6.6 assessed the same way for all groups?	N/A
6.8.	In diagnostic study, were details of test administration and replication sufficient?	N/A
7.	**Were outcomes clearly defined and the measurements valid and reliable?**	Yes
7.1.	Were primary and secondary endpoints described and relevant to the question?	Yes
7.2.	Were nutrition measures appropriate to question and outcomes of concern?	Yes
7.3.	Was the period of follow-up long enough for important outcome(s) to occur?	Yes
7.4.	Were the observations and measurements based on standard, valid, and reliable data collection instruments/tests/procedures?	Yes
7.5.	Was the measurement of effect at an appropriate level of precision?	Yes
7.6.	Were other factors accounted for (measured) that could affect outcomes?	???
7.7.	Were the measurements conducted consistently across groups?	Yes
8.	**Was the statistical analysis appropriate for the study design and type of outcome indicators?**	Yes
8.1.	Were statistical analyses adequately described and the results reported appropriately?	Yes
8.2.	Were correct statistical tests used and assumptions of test not violated?	Yes
8.3.	Were statistics reported with levels of significance and/or confidence intervals?	Yes
8.4.	Was "intent to treat" analysis of outcomes done (and as appropriate, was there an analysis of outcomes for those maximally exposed or a dose-response analysis)?	N/A
8.5.	Were adequate adjustments made for effects of confounding factors that might have affected the outcomes (e.g., multivariate analyses)?	Yes
8.6.	Was clinical significance as well as statistical significance reported?	Yes

8.7.	If negative findings, was a power calculation reported to address type 2 error?	N/A
9.	**Are conclusions supported by results with biases and limitations taken into consideration?**	Yes
9.1.	Is there a discussion of findings?	Yes
9.2.	Are biases and study limitations identified and discussed?	Yes
10.	**Is bias due to study's funding or sponsorship unlikely?**	Yes
10.1.	Were sources of funding and investigators' affiliations described?	Yes
10.2.	Was the study free from apparent conflict of interest?	Yes